

American Cinematographer

Published by the American Society of Cinematographers, Inc.



This Month:

**The Evolution of Studio Lighting—
By Harry D. Brown**

**The Great Task of Editing "Ben
Hur"—By William R. Swigart**

**How Cinematography Aids Big Indus-
try—By Herbert Gay Sisson**

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TITLE

The New Commandment
Go West
Compromise
The Bashful Buccaneer
The Best People
Lights of Old Broadway
The Keeper of the Bees
Seven Keys to Baldpate
Speed Mad
Triple Action
Bobbed Hair
After Marriage
The Knockout
The Road to Yesterday
Old Clothes
The Scarlet Saint
The Arizona Sweepstake
New Brooms
The Prairie Pirate
Wandering Footsteps
Common People
All Around the Frying Pan
Three Pals
When the Door Opened
Rose of the World
The Big Parade
Lord Jim
The Clash of the Wolves
Stella Dallas
The Ancient Highway
Bright Lights
Two Fisted Jones
The Eagle

Stage Struck
No Man's Law
Heartless Husbands
One of the Bravest
Morn's for Men
The Shadow of the Mosque
Simon the Jester
Wages for Wives
Clothes Make the Pirate
The Sea Wolf
The Only Thing
Hogan's Alley
Free to Love
Irish Luck
The Scrappin' Kid
The Unguarded Hour
Lady Windermere's Fan
The Desert's Price
The Masked Bride
The Desperate Game
The Phantom Express
The Best Bad Man

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American Cinematographer

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A. S. C. to Stage Huge Motion Picture Ball

Affair for Film Profession
to Be Held at Hotel Biltmore,
in Los Angeles.



Saturday Night, February 20th,
Is Date Set for Elaborate
Cinema Event.

The American Society of Cinematographers will stage a ball for the motion picture profession at the Hotel Biltmore, Los Angeles, Saturday night, February 20th, it has been announced by the A. S. C. Board of Governors.

Extensive preparations are already well under way to make this the most colorful of all the A. S. C. balls which have numbered some of the most successful functions in the film industry.

Fifth Ball

This will be the first ball to be presented by the Society since October, 1923, at which time the fourth A. S. C. ball was held. The latter affair was conceded to have been one of the most beautiful events in the history of filmdom. Its important happenings and musical presentations were broadcast to the radio world over KHJ, the outside populace having been given its initial opportunity to "listen in" on this exclusive motion picture ball.

A major part of the Society's activities having been monopolized with the construction of the A. S. C.'s special quarters in the Guaranty Building, Hollywood, no ball has been presented by the cinematographers in more than two years with the result that all of the stored-up energies of the membership are now being concentrated on making the forthcoming affair the most pretentious ever undertaken by the Society.

In Charge

The A. S. C. members in charge of the ball activities are Homer Scott, president of the American Society of Cinematographers, as chairman of the ball committee; Fred W. Jackman, former president of the Society, treasurer of the ball committee; and Arthur Edison, chairman of the special committee on entertainment. Richard Connor, widely experienced in the staging of similar functions, has been retained by the Society to handle the actual management of the ball.

A feature of the occasion will be a lavish souvenir program which will be presented to every person attending the affair. Space in the program is already being reserved by prominent members of the film profession as well as by leading cinematographic and mercantile organizations. This will be the first time in several years that the A. S. C. will issue such a program, and it is predicted that its success will parallel that of the ball itself.

Philip H. Whitman, A. S. C., Enters New Cinema Field

Philip H. Whitman, A. S. C., has joined the staff of the Mack Sennett studios where he is co-directing and writing stories for Mack Sennett comedies.

Whitman's identification with the Sennett forces marks the resumption of an association which began in 1915 at which time he started his cinematographic career with the same organization. It was there that he first manifested the camera genius which has made him one of the outstanding figures in the profession of motion photography. The A. S. C. member is recognized as a master of trick and intricate cinematography, which stands him in good stead in his new connection in the comedy field.

Notable Achievement

Subsequent to his original connection with the Sennett studios Whitman was in charge of the special trick and miniature cinematographic department at Universal City. He left Universal to become associated with Arthur Edison, A. S. C., in the filming of the intricate phases of Douglas Fairbanks' "The Thief of Bagdad." Whitman's work commanded such wide attention that he was called to New York City to do similar special work for Cosmopolitan, after which he was placed under contract to handle the intricate camera work at the eastern studios of the Famous Players-Lasky Corporation.

Filming "Ben Hur" Chariot Race Scenes

By George Meehan,
A. S. C.

Remarkable Results Regis-
tered by A. S. C. Members
on "Circus Maximus"



Left, George Meehan, A. S. C. Above, a chariot race still which the cinematographers captured.

A new world's record in the number of cinematographers employed in the "shooting" of motion picture action was established in the filming of the

chariot race scenes in the Metro-Goldwyn-Mayer version of "Ben Hur." Forty-two cameras, each directed by an expert cinematographer, "covered" every angle of the Circus Maximus act and, according to officials of M.-G.-M. it is going down in film history as one of the most thrilling race pictures ever recorded for the silver sheet.

Results Praised

Metro-Goldwyn-Mayer officials, including E. J. Mannix, comptroller; Joe Cohn, production manager, and John M. Nickolaus, laboratory chief with that organization, are loud in their praises for the skill of the cinematographers who captured all the desired results without necessitating the lapping over into another day which would have meant an added expense of thousands of dollars for the hundreds of people who were used in the scenes.

The former record of cinematographers used at one

time in the filming of a motion picture stood at 17, it is said, but in order to capture every detail of the great "Ben Hur" chariot races in which

Great Work!

The following letter and the copy referred to herein were sent to E. Burton Steele, A. S. C., by John M. Nickolaus, head of the Metro-Goldwyn-Mayer laboratories. Similar letters were sent to other A. S. C. members whose work proved so superlative in the chariot race scenes.

Mr. E. Burton Steele,
Dear Mr. Steele:

Your work on the Circus Maximus last Friday and Saturday was very excellent and I want to thank you personally and in behalf of this Company for your efforts and your fine spirit of co-operation.

Enclosed you will find a copy of a letter which Mr. Mannix sent me which expresses the sentiments of the officials of this Company.

Again thanking you, I remain,

Yours very truly,
(Signed) JOHN M. NICKOLAUS

Mannix Letter

Mr. John M. Nickolaus,
Dear Nick:

I wish to compliment you and your cameramen upon the great work accomplished during the filming of the chariot scenes in Circus Maximus on Saturday last.

I wish that you would express to each and every one of these men, as a representative of the Studio officials, appreciation of the fine spirit with which they all carried on, and the great results accomplished.

It is indeed a pleasure to have men of this calibre do our photographic work.

Mr. Thalberg, Mr. Noble, and I can all of the film taken, and we feel proud of everything that they filmed.

I wish that you would see that this word of appreciation is carried on to each and every one of them.

Sincerely yours,
(Signed) E. J. MANNIX.



E. Burton Steene, A. S. C., explaining to Ramon Novarro operation of Akeley camera with which Steene recorded remarkable shots on the Circus Maximus set

Ramon Novarro and Francis X. Bushman were the principals, 42 cinematographers were stationed about the mammoth amphitheatre at every conceivable angle and in such a manner that every beat of the horses' hoofs, the flexing of muscles, the careening chariots, the tense expressions of the spectators as the race came to its thrilling climax were registered.

Well-Laid Plans

The arrangements for the filming of the Circus Maximus act were made by Percy Hilburn, and the writer. Weeks of detail work preceded the actual filming of the scenes but so well had the pre-

liminaries been taken care of in anticipation of the great event that it was carried to the climax with a precision that drew unstinted praise and commendation from Louis B. Mayer, vice president in charge of production, Fred Niblo, the director, as well as the stars of the classic.

A. S. C. Members

In addition to the writer, among the other members of the American Society of Cinematographers taking prominent parts in the filming of "Ben Hur" race scenes were: H. Lyman Broening, Max Du Pont, Frank Good and E. Burton Steene. Mr. Hilburn was in charge of the cinema-

tographic brigade on the first day of the shooting, but thereafter the writer was in charge of the remainder of the work which was specially directed by Reeves (Breezy) Eason.

The work of E. Burton Steene, veteran cinematographer and expert with the Akeley camera, alone is said to have saved the M.-G.-M. company many thousands of dollars. Steene, left to his own devices on a parallel 120 feet in the air, got the crux of the entire race with unbelievable clearness—namely, the crash of the chariots of Bushman and Novarro. Exercising to the utmost the facility of the Akeley camera, of which he is a recognized master, the A. S. C. member kept the careening chariots of the two principals both in the picture, with the result that every detail of the impact shows in the finished picture. By the use of a seventeen-inch lens, Steene fills the entire screen with the crash. That this shot, which it is believed will become historic, could not be duplicated in a hundred fold of efforts is the opinion of the cinematographic experts who have viewed its exhibition.

All Details Captured

Regardless of what Bushman and Novarro were doing in the wild ride around the track they were always covered by the "eyes" of a dozen cameras. Automobiles made especially for the occasion were so built that ample room was provided for a veritable battery of cinematographers and these machines kept pace with the principals as they whirled the track, thereby enabling the cinematographers to register every detail of the struggling horses and men as they fought for victory.

How Cinematography Aids Big Industry

By Herbert Gay
Sisson

National Cash Register
Company Made Early Use
of Motion Picture Film

(The following interesting account, both from an historical and industrial viewpoint, indicates the use to which cinematography may be put with success by a large commercial organization. The article comes from the pen of Herbert Gay Sisson and is taken from the National Cash Register Company's bulletin, "Progress.")

The progress of the motion picture, one of the outstanding developments of the first quarter of the present century, has affected not only the daily lives of millions through providing an inexpensive medium of entertainment, but it has also become a force in the industrial life of the nation. There are few important manufacturing establishments that do not have films showing their processes of manufacture and telling the story of the development of their product and its importance to the world. Films are also widely used by industry for purposes of instruction and training.

The first large industrial concern in the country to adopt motion pictures in a program of ambitious scope was The National Cash Register Company, and it is doubtful whether any company today uses the motion picture as consistently and for so many objects as does the Dayton, Ohio, organization. This Company's use of the motion picture began in 1902, when special films were made and incorporated in an illustrated lecture on welfare work which was then being given to manufacturers' organizations throughout the country and to visitors to the N. C. R. factory at Dayton.

Today the National Cash Register Company has in its film vault 773,877 feet of positive prints of motion pictures, and 244,702 feet of motion picture negative. In addition, the Company is a daily center of film from the motion picture industry. Motion pictures are used in special lectures, in an educational film service provided by the Company for the advancement of visual education, in daily noon-hour entertainments provided free for its employees, in weekly Saturday morning children's meetings given to an average of three or four thousand children of the city, and in educational work carried on by the Company among its workers and members of its selling forces.

Worthy Causes Aided

The use of motion pictures by The National Cash Register Company is not confined to films that have to do with the commercial activities of the organization. Upon numerous occasions films have been prepared to aid worthy movements entirely separate from the cash register business. An instance of this occurred in 1924 when Frederick B. Patterson, president of the Company, was at the head of the National Aeronautic Association of the United States. Securing the collaboration of the Bray Motion Picture Studios, Mr. Patterson had a thrilling four-reel film prepared, entitled "Make America First In The Air." This picture, after being approved by the heads of the government air services, was shown in most of the important cities of the country as the basis of an appeal for membership, with the result that the Association's ranks were more than tripled.

Properly to describe the various ways in which motion pictures have been utilized to foster the development of The National Cash Register Company, and the spreading of its principles and idealism, it is necessary to go back in the Company's history to the year 1894.

The late Mr. John H. Patterson, founder of the Company and at that time its president, always firmly believed that the best way to teach is through the eye. Consequently, when in that year it became evident, through the return of a number of defective registers, that the industry was suffering from faulty workmanship, one of the first steps taken was to teach the employees better ways of working through visual methods. This was only one of a number of new and advanced policies launched by Mr. Patterson at that time, which marked the inauguration of industrial welfare work in the United States, revolutionized working conditions in this country, and caused The National Cash Register plant to become known as "the world's model factory."

Moving his desk out into the factory, Mr. Patterson conducted an investigation and found many things that were wrong. He had crude, hand-drawn stereopticon slides prepared. Calling a meeting of all employees in

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The Evolution of Studio Lighting

By Harry D. Brown

Film Illumination Makes
Tremendous Strides in
Period of Twelve Years



Harry D. Brown

In the year 1914 I became installed as chief electrician for the Universal Film Company at the then embryo Universal City. This was in the days of canvas diffusers and artificial lighting was unknown in Hollywood as red flannel underwear in the South Sea Isles. The high art of using reflectors had not even been developed. Even "Come Dawn" and "Later" had not yet begun their hectic careers as subtitles.

"It's raining, boys, let's go home" was not an uncommon cry and all Filmdom were pagan worshippers of the Sun god.

Indoor Studio

Not long after my advent as Universal's electrician, along about the middle of January, 1915, Isidore Bernstein, then general manager, concluded that the company should have an indoor studio. He was probably inspired by the difficulties attending the

"shooting" of "The Master Key," a serial which Bob Leonard was directing and in which he and Ella Hall were featured. This had been a particularly stormy season—most unusual for California, as any native son will testify—and the serial was behind releasing schedule.

First Cooper Hewitts

Acting upon Mr. Bernstein's order, we selected a garage and converted it into our first indoor studio, into which we invested all the available studio lighting equipment in Los Angeles, i. e., five Kliegl side arcs and one 35-amp. spotlight. To this we added 20 banks of Cooper Hewitts, which we ordered from New York, the first to come to the coast.

Pioneer Electrical Force

We soon followed this up with the installation of 1000 W. nitrogen lamps, which were just being developed as overhead equipment. With this auspicious beginning we proceeded to "shoot" in our proud indoor studio many of the scenes of "The Master Key," which also included several exterior street scenes. The electrical force at Universal at this time was made up of five men, one of whom was Paul Guerin, now chief at the Mack Sennett Studio, and another Walter Strohm, now chief at United Studios.

Winfield-Kerner's

The spring of 1915 saw the coming of the Winfield-Kerner Company's studio lamp, which was adopted and used by most of the studios operating in California. This com-



Frank N. Murphy

pany had previously manufactured photo-engraving lamps. The Winfield-Kerner lamps came into use during the régimes of Messrs. McGill and Harry Caulfield as Universal City general managers. Our total capacity in transformers was 100 K. W. A. C., which included all the power for pumps, etc.

Five Minute Limit

In the latter part of 1915 Universal made a picture called "Lass O'Leary," which called for a rather large street set and considerable night stuff. Our total capacity on this street was 30 K. W. A. C. With fast work on the part of the cinematographers we were able to keep the load on about five minutes without burning up the transformers. "Lass O'Leary" was filmed during Henry McCrae's reign as general manager.

We often worked all night

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Rack and Airbell Markings on Cinema Film

Concluding Part of Exhaustive
Treatise Begun in December Issue
of American Cinematographer.

By J. I. Crabtree
and C. E. Ives

Findings of Authorities Reported
in Research Laboratory Com-
munication from Eastman Co.

(Continued from last month, in which complete
illustrations appeared.)

If the airbell forms on the film along the sides of the rack, owing to the tendency of the air to rise to the surface, the airbell frequently becomes elongated so that the area of contact is not circular but oval. The tendency for distortion is greater with the larger airbells, which explains why the larger airbell markings are rarely circular, while the small markings are invariably circular.

A typical group of circular and irregular airbell markings is shown in Fig. 7.

Unless the surface of the emulsion is locally greasy or burnished, the points of attachment of the airbells are determined merely by chance. However, there is usually a greater propensity for the airbells to become attached where the film passes over the ends of the rack so that rack marks are usually accompanied by airbell markings. See Fig. 8.

Classification of Airbell Markings

Airbell markings may be of the following types:

1. *Clear white spots.* These may be either circular or irregular in shape as explained above. See Fig. 7. The clearcut edge of the spots indicate that the area of contact of the airbells did not materially alter during the course of development.

2. *Grey spots.* These are similar in shape to those illustrated in Fig. 5 but are not perfectly clear and contain more or less silver grains. They are caused by the airbell breaking or becoming dislodged during development so that the spot was protected for only a part of the total time of development.

3. *Clear spots surrounded by a dark ring.* See Fig. 9. The dark ring is probably a result of developer oxidation fog caused by local oxidation of the developer by the airbell. This type of marking occurs only rarely and with freshly mixed developers which are susceptible to aerial oxidation fog. In such a case if the film remains stationary during development the oxidation products of the developer flow down the film and frequently produce a fog streak or tail as shown in Fig. 10.

4. *Clear spots surrounded by a grey ring.* See Fig. 11. The grey ring is probably caused by a diminution in the area of contact of the airbell with the film due to a change in shape during development as explained above.

5. *Clear spots with a dark central ring.* See Fig. 12. Examination of the dark nuclear ring showed that this consisted largely of silver. The exact method of formation of such markings is not known though they could be formed by bursting of the airbell just before the film was removed from the developer so that the whole airbell area became saturated with developer, and the reforming of a smaller central bubble when the film was immersed in the fixing bath. This second bubble would prevent the access of the fixing bath and permit of development of the image underneath by the developer absorbed by the film after the bursting of the first bubble.

Such a marking could also result from the printing of a positive image from a negative containing airbell markings similar to those described under "3" above, namely "clear spots surrounded by a dark ring."

6. *Clear spots with a nucleus of silver halide.* The appearance of these spots by transmitted light is essentially the same as those shown in Fig. 12, although the dark central ring consists largely of silver halide instead of metallic silver. The method of formation of such spots is probably as follows: During development the airbell prevents access of the developer to the emulsion and persists until the film is removed from the developer. On reimmersion in the fixing bath a small airbell forms where the larger bell previously existed, thus protecting the emulsion from fixation.

The difference between the spots indicated under 5 and 6 is, therefore, merely a result of slight wetting of the previously protected airbell area with developer immediately before fixing. A nucleus of silver halide is produced in one case and a mixture of silver halide in the other.

Factors Affecting the Number of Airbells Formed

The quantity of airbells which may ac-

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The EDITORS' LENS . . . focused by FOSTER GOSS

Credit in Programs

- ¶ Now that the period of resolutions for the new year is at hand, the cinematographer might well ask that the exhibitor give cinematography the credit that is due it in the exhibition of each and every production. To the mentors of the larger theatres might be addressed the appeal to refrain from cutting credit titles. To the exhibitors of the smaller houses might be directed the request that, if they receive a print from which the credit titles have been cut, they at least insert the name of the cinematographer in the programs. The latter information should be forthcoming from the exchanges. If it isn't, a letter directed to the American Society of Cinematographers in Hollywood—if the exhibitor's bookings are far enough in advance—will bring the same information.

No "Hokum" in Cinematography

- ¶ The cinema has had to suffer, more than any industry, the appellation, "hokum," to be associated with it. Perhaps there has been plenty of hokum relating to the films; at the same time, other lines of endeavor have not been clean of it.
- ¶ This much, however, is worthy of passing note—the basic thing about motion pictures, cinematography, has been singularly free of hokum. Of necessity, no doubt, is this so. Aside from personal preferences for one style of camera work or the other, cinematography, judged from reasonable precepts, must stand on its own feet when it is given its one and only test—showing on the screen. There may be handicaps of poor projection, but there can be no illusions—or "hokum," if you please—about the cinematography that the public sees.
- ¶ There is little place for the unstable foibles in the field of cinematography. If improvement lends itself to the steady ad-

vancement of the science, then it becomes a part and parcel thereof. If it is not conducive to progress, it is soon eliminated. Spasmodically, there may appear various manners of "processes" and the like that may hope to thrive on the supposition that the motion picture industry is susceptible to "hokum," but if those special methods do not measure up to the most thorough-going standards of camera work, the fallacies are soon detected and the promoters and sponsors find themselves high and dry on the rocks of incredulity.

- ¶ Whether cinematography is applied to entertainment, education or whatnot, it is a science all to itself. It is here just as surely and securely as photography itself. It is a gift to mankind. "Hokum" finds the camera a barren pasture, and they who would sow the seeds thereof may well put forth their efforts more profitably elsewhere.

A Real Feature

- ¶ Continued comment on the selection by this publication of the productions with the best cinematography for the past year reveals many interesting phases. The novelty of the feature has proved extremely appealing and contributors to other publications have been quick to take note.
- ¶ While it was the original intention to pick the five pictures with the best cinematography of the past year, this idea was laid aside when there became apparent the size of the task of the critics who perforce had to delve into retrospect for the selections for which they were queried. If they had had the purpose in mind when they were reviewing the different productions during the course of the year, such a procedure would have been more feasible. Hence, as was explained in the Annual Number, all the features cited were presented on a single Roll of Honor, no consecutive number being essayed.

The Great Task of Editing "Ben Hur"

By William R. Swelgart

Crux of All Sequences
Must Be Preserved in Cutting Down Lengthy Footage

The gigantic task of editing "Ben Hur" is about at the end of the rope. When we see it on the screen we will marvel at the huge sets, the mobs, the photography, the story and direction. But in retrospection of the task of building this picture, will there be a thought given to this branch which has played a prominent part in making such a spectacle presentable?

Great Amount of Work

Let us for a moment delve into the tremendous amount of work involved in editing "Ben Hur."

After talking with Lloyd Nosler, who is film editor of this great motion picture, I discovered, to my amazement, the great responsibility placed upon his shoulders. More than 1,600,000 feet of negative were shot on this picture from which 800,000 feet of positive were printed. With 16 pictures to the foot, this makes a total of 12,800,000 pictures with which Lloyd Nosler had to familiarize himself before attempting to assemble and edit.

When Mr. Nosler was appointed by the Metro-Goldwyn-Mayer Corporation to edit the film of this epic, he appreciated the honor, a most enviable honor in his profession. But in back of this appointment, M-G-M realized his ability and he was selected because of his past record of achievement in this field. He immediately sailed for Europe, where he was to join Director Fred Niblo. Upon his arrival, Nosler found in excess of 350,000 feet of film awaiting him and he immediately waded in to reduce this footage to continuity form which would enable Mr. Niblo to determine what could be done with the work already accomplished.

Having completed their work in Italy, the company returned home, where there was much to do to complete the picture. It was here that Nosler resumed the task of keeping up with the reels of film that were being constantly furnished after each day's work, but it was much more pleasant after he had organized a force of able assistants who knew what it was all about and could talk his language.

Three Great Sequences

Among the many sequences incorporated in this great super-production, there are three



Lloyd Nosler

which are outstanding because of their magnitude and importance to the story. These are the "Joppa Gate," the "Galley" and the "Circus Maximus." The latter was shot in Culver City and necessitated the building of the largest motion picture set ever attempted in the history of motion pictures. It is a replica of the enormous chariot racing arena as it existed two thousands years ago in Antioch, which was at that time the second largest city in the world and second in importance only to Rome. It is reported that more than 200,000 feet of negative were shot on this one sequence. Forty cameras were used during the filming of the chariot races and one would believe by seeing so many cinematographers that it was an A. S. C. convention. However, they must receive a large measure of credit, for there was not a move made in this huge scene but what it was picked up by one or more of the cameras stationed at strategic points throughout the set. Some remained stationary, while others were mounted on

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The Evolution of Studio Lighting

(Continued from Page 5)

on the "Lass O'Leary" street set, sleeping a couple of hours in the transformer room, where it was warm and going about our duties maintaining the plant during the day.

Cinema Twin

In December, 1915, Universal purchased from W. W. Wohl, 50 overhead Wohls and 25 broadsides, and outside of buying some large deck Cooper-Hewitts, we made no additions to the plant equipment until the late summer of 1917, at which time Winfield - Kerner brought out the Cinema Twin, which is substantially the same type of lamp in use today. Meantime, of course, other studios had introduced much new lighting equipment of varying makes.

In this interregnum H. O. Davis had served his term as general manager and the office came into the able hands of William Sistroon. In the early part of 1918 the Sunlight Arc Company introduced what is known as the Sun Arc. This light became very popular, particularly for street and location work, and is still used to a considerable extent.

These retrospections are probably also the reflections of the experiences of Frank

Gotham Critic Praises Clark

An outstanding tribute to the cinematography of Dan Clark, A. S. C., who is chief cinematographer for Tom Mix on Fox productions, is paid in the following New York dispatch in the Los Angeles EXAMINER from Edleen Greenman, motion picture editor for UNIVERSAL SERVICE.

"Tom Mix is the hero of 'The Best Bad Man,' but it is his cameraman who walks away with most of the honors. The picture winds up in a long climax with some beautifully photographed scenes of a great dam bursting and rushing toward the audience in a torrent of danger. We are shown several remarkable exterior and interior shots of its destruction of the hut where Tom Mix is imprisoned."

N. Murphy, now chief engineer for Warner Bros. Studios, and H. G. Ewing, president and general manager of Mincerva Pictures Corp., both of whom started their careers in 1914. The latter served with Famous-Players-Lasky Corp. and was responsible to a large degree for the illumination for the excellent photography turned out by that company. Murphy engineered his first lighting in the late Thomas H. Ince's "Civilization."

It is rather difficult to give

facts and figures from memory, but if the reader will stop to consider that from what was considered a large set with 30 K. W. in the days of "Lass O'Leary," we advanced to the gigantic scenes in "The Hunchback of Notre Dame" with 2500 K. W. capacity, he will then realize how important the lighting of motion pictures has become.

Gigantic Jump

From 500 to 1000 kilowatts are used on the average interior set today, and as much as 5000 have been used on others. From an approximate total of 30 kilowatts back in 1914—used by all the studios—the Hollywood film industry today has a capacity for approximately 30,000. Certainly no mean barometer of the industry's growth.

Every studio chief has contributed his talents to the development of the art of motion picture lighting, and in no case have we had any outside assistance. He has not only improved his lighting equipment, but has invented and perfected such mechanical concoctions as wind machines, pumps, lighting machines and numerous other devices.

The studio chief engineer is a veritable tri-god, combining all the virtues of Helios, the sun god; Pluvius, god of rain, and Thor, lord of thunder.

American Society of Cinematographers

~ BALL ~

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Saturday, February 20th, 1926

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At last the need for a compact, light of weight professional camera of dependable quality has been supplied. The leaders of 1925, at the professional camera and equipment for the EYEMO standard camera, especially designed for field and stunt use.

EYEMO weighs but seven pounds and is so compact as a professional camera of equal capacity can ever be made. It is entirely automatic, operating by means of a spring motor. Has maximum film capacity 120' of standard negative. 160' rolls prepared for daylight loading and subbing are obtainable for use with EYEMO. 50 feet per roll in available—more than ordinarily necessary.

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BELL & HOWELL, a city of workmanship is evident in EYEMO. It is built with the same painstaking degree of precision and accuracy as B. & H. professional studio cameras. A 47 mm. F. 2.5 Taylor-Hobson Cooke lens in maximum mount is standard equipment. Other lenses up to 50" telephoto can regularly stocked and interchangeable by means of extensive focusing mounts completed. Adjustable speed feature permits varying the speed from 16 to 5 exposures per second.

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Descriptive folder giving all details and specifications sent upon request.



EYEMO is so named because it sights from the eye—like a spy glass. Can be held with the same steadiness as aiming a rifle. The image is seen in the eyepiece position. Easily followed, as the camera may be quickly shifted to another scene. Level stable in the finder tube assures getting pictures squarely on the film. A quick and general portable camera.

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The Great Task of Editing "Ben Hur"

(Continued from Page 1, 2)

mobile platforms, automobile trucks and airplanes. In some instances cameras were suspended by cables and propelled across the entire length of the arena, which measured approximately 1500 feet long. And with all this film, produced by such a large battery of cameras, you can imagine what a task it was to select 1000 feet which at most is about all you will see of this sequence in the finished picture.

Footage Reduced

The "Joppa Gate" sequence, which is the entrance to Jerusalem and was shot in Italy, is estimated to have furnished over 100,000 feet of film, which was reduced in the final editing to 1000 feet; and the "Galley Sequence" having furnished around 132,000 feet, was edited to 1500 feet.

Exhibiting Length

Perhaps you can understand the mechanical part of assembling this mass of film, but can you conceive the tremendous importance of reducing it to an exhibiting length and in such a manner that will please the audience of the universe? This is an art which few people have mastered. In order to edit a picture, one must know drama; he must be able to place himself in the same receptive mood as that of the great army of people who will ultimately view the picture. He must be able to tell the story in action and with the proper tempo, the same as you would expect to see it portrayed in life. He must know how to tune the many situations to get the maximum effect, and to do this, he must know the value of every bit of action and the length of time to keep it before the eyes of the audience. Above all, he must build his plot in action the same as the writer does in words, commanding the interest at all times until the climax is reached. To possess all these requirements, I dare say, it requires a great mind.

In the case of "Ben Hur" the responsibility of the final editing does not fall upon one man; it would be a physical impossibility because of its size, and so we find at this stage, three great minds, Fred Niblo, Irving G. Thalberg and Lloyd Nosler collaborating day and night, exerting their every resource of energy and brain power for one purpose, and that is to make the production of "Ben Hur" stand out as the greatest screen epic of all times.

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The emulsion is made sensitive to red, yellow and green, as well as blue to which regular film responds chiefly. Consequently all the colors you see, either on location or in the studio, can be reproduced in the negative in their true relationship.

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ROCHESTER, N. Y.

a nearby Jewish synagogue which had been abandoned and rented by the Company, he showed them by means of these slides the practices that were wrong and how they could be bettered. The effect was salutary and this marked the beginning of the Company's extensive use of the stereopticon, which has since been supplemented to a great extent by the motion picture.

100,000 Slides

In 1896, a photograph department was started at the factory, and after that time photographic slides were used. Despite the motion picture, the use of slides has by no means been discontinued. The Company has on hand at this day approximately 100,000 slides, containing views from every part of the earth and covering a wide variety of topics. The Company's auditoriums are equipped with wide screens, and double-screen stereopticons are used. In this manner a picture can be shown on one side of the screen and accompanying comment on the other. Songs for group singing are illustrated in this manner, a picture being on one side and the words of the song on the opposite side.

Following the inauguration of welfare work, Mr. Patterson had a lecture made up, which was illustrated with the stereopticon. It showed the beneficent results of welfare work, and Mr. Patterson gave the lecture personally to manufacturers' organizations in various parts of the United States to arouse their interest in more considerate treatment of their personnel. Shortly afterwards the Company adopted the policy of inviting visitors to go through the factory. Then a small room was fitted up as an auditorium and the lecture on welfare work was shown to the factory's daily guests.

Use of the 'Movie'

In 1902 the motion picture was still in a state of infancy and a smaller footage of film was being shown in the entire country than in any important city today. Intensely interested in visual education, however, Mr. Patterson saw that the motion picture was more effective in many ways than the stereopticon. He secured from the Edison Company a complete motion picture outfit and a cameraman and brought them to the factory. Thereafter both the traveling factory lecture and the one given at the plant were given as a combination of stereopticon and movies.



Among the many useful articles for which man craves possession, there is innumerable the product of one particular manufacturer, which dominates all others.

From pipes to motor cars, from chewing gum to pianos—wherever the article may be—there is always one distinctive product, that is recognized as the best.

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While traveling in Europe in 1911 Mr. Patterson saw an exhibition of Kinemacolor films, the first colored motion pictures. He became so interested that he paid the expenses of the inventor across the sea, brought him to Dayton and had him make a series of colored motion pictures, the first produced in America. The Kinemacolor pictures were principally views of landscape gardening around the factory and the beautiful front yards, back yards and window boxes in the neighborhood. They were used to illustrate a lecture on landscape gardening and home beautification. Three traveling outfits were sent with this lecture to all parts of the United States in the interest of community betterment.

Children's Meetings

A further use of the stereopticon that later was supplemented by motion pictures was in the case of the "pleasant Sunday afternoons," started by Mr. Patterson in 1897 for the benefit of the children of the neighborhood. The main feature of these entertainments in those days were talks on travel illustrated by the stereopticon. At the present time these children's meetings are held on Saturday mornings, the attendance weekly averaging 3,000 or more, and instructive and entertaining motion pictures constitute the bulk of the program. These meetings are free to all children of the city or vicinity. Each child enjoys an hour or more of motion pictures and songs, and refreshments are served.

In 1915, a motion picture was produced entitled "The Troubles of a Merchant and How to Stop Them." This was used in conjunction with another film entitled "Getting the Most Out of Retailing." For a number of years, five traveling lecturers presented these films to educate the retail merchants throughout the United States and Canada. They were given to Chambers of Commerce and leading merchants' organizations.

A year or two before America entered the World War a film was made in different hospitals throughout the country showing the terrible results of social diseases. This was shown to the conventions of salesmen and to the factory employees, and is still being shown to all new employees. In 1917, Mr. Patterson had the picture revised and sent it to Washington where it was approved by government officials and he then sent this picture out to all army camps so that it was seen by

(Continued on Page 77)

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American Cinematographer**

Rack and Airbell Marking on Cinema Film

(Continued from Page 71)

accumulate on the film is determined by the following factors:

1. *The manipulation of the rack.* This determines:

(a) The rate of immersion of the film. If the film is immersed rapidly there is a much greater tendency for it to carry down airbells than when immersed slowly. It is important therefore, to immerse the rack slowly, especially when the end slot touches the surface of the developer because most airbells usually accumulate along the end slots.

Rapid immersion is also apt to cause foam on the surface of the developer and the small air bubbles constituting the foam attach themselves to the film causing airbells.

(b) The time of soaking before removing from the developer. Experience has shown that if the film is immersed quickly in the developer, allowed to remain submerged for only a few seconds and is then lifted completely out of the developer and resubmerged, a much larger quantity of airbells will be formed than when the film was originally immersed.

Short immersion of the film in the developer followed by exposure to the air leaves the film in a partially swollen state and in this condition it has a much greater propensity to carry along airbells with it on subsequent immersion than the dry or completely swollen film. It is usually necessary to allow the film to soak for at least twenty to thirty seconds after the first immersion in order to remove this tendency.

(c) The degree of agitation of the rack. In many cases airbells can be dislodged after the film has been thoroughly soaked by rapid agitation of the rack or by slapping the end slot against the surface of the developer, though when developing by time it is necessary to duplicate the rack agitation precisely and too much rack manipulation is not practical. It is preferable to remove the airbells manually as described below.

2. *The Quantity of Grease on the Film.*

A very slight trace of grease or oil on the film will so affect the surface of the emulsion that it has a greatly increased tendency to attract airbells. Any appreciable quantity of oil or grease will also act as a resist and prevent

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4 1/2 in.	153.00	81.00
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Also the famous long focus Taylor-Hobson Cooke Tele. lenses are now available for cinematograph work in sizes from 8 1/2 to 50 inches. For all around close focus work the City lens at \$250.00 (not including mount) offers the speediest aperture of F 5.3—maximum distance of field with perfect color correction.

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American Cinematographer

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Hollywood, Calif.

the access of the developer. Preliminary soaking of the film in a solution of sodium carbonate will often overcome this tendency (see below).

3. The Condition of the Developer

Experiments have shown that old developer which frequently tends to foam badly has a greater tendency to give airbells than new developer. This foaming is the result of the presence of decomposed gelatin produced by the action of the alkali in the developer on the small particles of emulsion removed from the film by abrasion. The effect of the addition of ethyl alcohol to such a foaming developer was tried but no beneficial effect was observed by the addition of increasing quantities of the alcohol up to 10%.

Method of Preventing the Formation of Airbells

The formation of airbells may be prevented as follows:

1. By soaking the film in water or a solution of sodium carbonate (about 2%) before development. This has the effect of thoroughly soaking the gelatin, in which condition the propensity for airbells to form is a minimum, while the carbonate solution tends to remove traces of grease which would otherwise cause airbells and prevent access of the developer. The carbonate treatment, however, will not remove splashes of mineral oil.

Any airbells which cling to the film during the soaking process can be removed manually by passing a soft camel's hair brush along the top slot, reversing the rack in the tank and repeating the process.

After soaking the film it is very necessary to thoroughly agitate the rack for the first minute after immersing in the developer, otherwise the liquid carried over by the film will still adhere and cause development streaks.

Soaking is objectionable insofar as it involves an extra operation and is really not necessary if the manipulation outlined below is followed.

2. By taking care not to use developer which is too old and which foams badly, by immersing the rack slowly, and by allowing the film to remain under the surface of the developer for at least 30 seconds before lifting out of the developer for any reason whatever.

3. By removing the airbells mechanically.

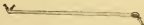
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(Continued from Page 191)

every enlisted man shortly after he entered camp. This film is regarded as the most effective warning against the dangers of sexual vice that has ever been produced.

Helped Nation's Morale

As a further contribution to the winning of the war, Mr. Patterson had prepared a lecture entitled "Wake Up America," in which both the stereopticon and moving pictures were used. The object of this lecture was to teach the American people the causes of the war and why we were in it, and to arouse the country to the necessity of devoting all their energies to winning. The five lecture outfits that were given the merchants' educational lectures devoted all their time in presenting this lecture in all parts of the United States.

One of the most noticeable effects of the war in the industrial life of the country was the fostering of inefficiency and wastefulness on the part of workers. To combat this attitude, in 1919, The National Cash Register Company had a film made up which was entitled "Waste Can't Win." It was a clever exposition of the prevalent bad habits and tendencies of the day, and the results of showing it were so evident that it was borrowed by hundreds of manufacturers throughout the United States and shown by them to their employees. This film was everywhere regarded as a big factor in the return of the American workman to "normalcy" following the hectic war days.

About six years ago the factory lecture was revised and is now all motion picture, instead of a combination of movies and slides. It is given in the N. C. R. Schoolhouse twice a day to those who visit the factory, in number about 26,000 per year.

Special 'Movies'

Motion pictures are made of all of the Company's sales conventions, pageants, special visitors. These pictures, as well as our merchants' pictures, are used as part of the instruction of salesmen in the Company's sales school.

Both the stereopticon and motion pictures are used daily in the Company's repair school in connection with the teaching of the mechanics of cash registers to service men.

The main projection room is in the N. C. R. Schoolhouse, an auditorium that seats about 2,300 people. This auditorium is equipped with a complete stage, capable of

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putting on the largest productions. In this projection room are three high intensity arc simplex projectors, one double screen stereopticon, two single stereopticons, and four spot and flood lights. There are four other projection rooms; one in a classroom back of the Schoolhouse stage, one at the N. C. R. City Club auditorium, one at the screening room, and one in the repair school. Each of these is equipped with two motion picture projectors and double screen stereopticon.

The Company also maintains an educational film service, loaning films to schools, churches and organizations for the purpose of promoting visual education. This film service contains travel pictures, scenes, films depicting various industries, pictures of animal and plant life and others. They are loaned free of charge to any worthy organization.

(Continued From Page 22)

Experience has shown that even when the above precautions are taken some airbells may still cling to the film, and especially at those parts where the film passes over the end slats. The only way to be absolutely certain of the absence of airbells at these points is to remove the airbells by passing the hand or a soft camel's hair brush along the upper and lower slats during the course of development. If this is done with reasonable care the film emulsion will not be damaged or scratched in any way although no trace of hypo must be present on the fingers or brush, otherwise streakiness will result.

With the usual rack it is not possible to pass the hand across the slat owing to interference by the separating pins. This difficulty may be overcome by offsetting the pins at an angle of 45° as shown in Fig. 4 or by omitting the pins on the slats and placing a bar fitted with spacing pins slightly below the end slats.

Practical Instructions for Preventing Rack Marks and Airbell Markings

Both rack marks and airbell markings may be largely prevented by adhering to the following manipulative procedure which should be applied when developing both negative and positive film.

1. Use racks with cylindrical end slats approximately 2 inches in diameter, with the spacing pins offset at approximately 45° so as to permit of passing the hand or brush along

Taken in a Pouring Rain at Dusk, with

The ULTRASTIGMAT-f1.9

Gentlemen

I enclose some pieces of negative which I took in a pouring rain at ten minutes to 6 o'clock on September 12, the last event of the Rochester Horse Show.

This film was used in International News Reel No. 78.

Without your wonderful UltraStigmat speed lens F. 1.9 I believe it would have been impossible to get this picture.

(Signed) CAROL FENYVESSY,

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the length of the slats so as to dislodge any air-bells.

2. Lower the rack slowly and carefully into the solution and when the lower slat is just below the surface pass the hand quickly along its entire length so as to dislodge any airbells. Then completely submerge the rack, and in a similar manner quickly pass the hand across the upper slat and allow the rack to remain submerged for 30 seconds. Then allow the rack to float, resubmerge immediately and repeat this operation once every minute during the period of development.

3. In case this treatment does not entirely prevent airbells, the film should be soaked in water or a 2% solution of sodium carbonate for 3 or 4 minutes before development, and in addition to this the rack should be moved continuously during the first 30 seconds while submerged in order to prevent streakiness.

Fail to Credit A. S. C. Member for Filming Big Productions

A number of trade journals failed to carry credit in their reviews to Georges Benoit, A. S. C., for the cinematography in a number of important productions. Included among these are "The Scarlet West," "Off the Highway," in which, by virtue of the dual role of William V. Mong, Benoit again had an opportunity to display his thorough execution of multiple exposure; and "The Rubaiyat of Omar Khayyam," which is being released under the title of "The Lover's Oath."

Ernest Palmer, A. S. C., is photographing the Fox feature, "The Price of Pleasure," directed by Emmett Flynn.

Barney McGill, A. S. C., is filming the Fox production, "A Trip to Chinatown."

Ross Fisher, A. S. C., is photographing "The Tough Guy," the latest Fred Thompson feature being produced at the F. B. O. studios.

Charles Stumar, A. S. C., is filming "Poker Faces," a Universal production directed by Harry Pollard.

Robert Kurrle, A. S. C., is making preparations for the photographing of the next Edwin Carewe production for First National.



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The Bauch & Lomb Ultra Rapid Anastigmat is an f:2.7 lens. This not only is its rated speed—it is the speed at which it actually performs.

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Webster's New International Dictionary

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Springfield, Mass., U. S. A.

American Society of Cinematographers Ball

Hotel Biltmore, Los Angeles

Saturday

February 20th, 1926



Robert Kurrle, A. S. C., is photographing "Heirs Apparent," an Edwin Carewe production for First National. Among those who will appear before Bob's camera are Edwards Davis, Alec B. Francis, Dolores del Rio, Rita Carewe, Lloyd Hughes, Mary Astor and John Murray.

Arthur Edson, A. S. C., is photographing "The Bat," which Roland West is directing as a John W. Considine, Jr., production for United Artists.

John W. Boyle, A. S. C., has completed the cinematography on "The Far Cry," a First National production directed by Sylvano Balboni, and is at present engaged on the photographing of Lambert Hillyer's latest production for the same organization.

Bert Glennon, A. S. C., is photographing the latest Paramount production starring Pola Negri. Dimetri Buchowetzki is directing. This is the third consecutive feature on which the A. S. C. member has been chief cinematographer for Miss Negri.

E. B. Du Par, A. S. C., has been on location on a big sheep ranch near Santa Paula, California, for the filming of the latest Warner Bros. production starring Rin-Tin-Tin. The title of the feature is "The Night Cry." The cast includes June Marlowe, John Harron, Gayne Whitman, Heinie Conklin and Don Alvarado. Herman Raymaker is directing. The past year has been one round of locations for the A. S. C. member who, prior to his departure for Santa Paula, had just returned from location in Toronto, Canada, where he went with Lubitsch and Charles Van Eger A. S. C., for the filming of scenes in "Lady Windermere's Fan."

Through the courtesy of C. J. Hubbell, west coast manager for International Newsreel Corporation, there was presented at the A. S. C. open meeting of December 14th the reels of International's compiled "thrills" of the past ten years. The exhibition was well

received by the A. S. C. members, several of whom began their careers as news cinematographers. Refreshments were served following the meeting.

The A. S. C. open meeting of December 28th was featured by the showing of the latest pictures in the "Secrets of Life" series, photographed by Louis H. Tolhurst, A. S. C. These proved some of the most interesting of the Tolhurst pictures that have been viewed to date.

John Arnold, A. S. C., is being congratulated on all sides for his superior cinematography in "The Big Parade," the Metro-Goldwyn-Mayer success which he photographed.

Dan Clark, A. S. C., is out of the city several days on location for the filming of the latest Tom Mix feature.

Victor Milner, A. S. C., has completed the filming of "The Golden Journey," the R. A. Walsh production for Paramount. Buster Collier and Greta Nissen head the cast.

Norbert Brodin, A. S. C., through the courtesy of Frank Lloyd productions, is photographing "Paris at Midnight," a Frances Marion production being directed by E. Mason Hopper at the Metropolitan studios.

Frank Cotner, A. S. C., has finished shooting "The Blind Trail" and "Without Orders," both of which star Leo Maloney.

George Schneiderman, A. S. C., has completed the filming of the Fox production, "The Johnstown Flood," directed by Irving Cummings. The flood scenes call for all of the A. S. C. member's expertness as a cinematographer.

Reginald Lyons, A. S. C., has finished shooting "The Fighting Buckaroo," a Fox production starring Buck Jones.

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Lockwood, J. B.—
London, Walter—with Harold Lloyd Productions, Metroland
Lyn Studios
Lynn, Eugene—with Jack Jones Fox Studio

Marshall, Wm.—with Carlton Prods.
McLeod, T. D.—with First National United States
McNeil, Thomas—with Warner Bros.
McLennan, Kenneth G.—with Warner Bros.
Merrill, George—
Miller, Arthur—with E. A. Walsh Famous Players-Lasky
Morris, Art—with Metro Goldwyn Pictures Fox Film
Mulligan, Walter—

Morris, Stephen S.—Fox Film Studios

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Perry, Paul—with Universal
Paine, Ed—with Sam Streisberg Productions

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Risher, Charles—with Mae Martin, Olin Studio

Schneideman, George—with Fox Studio
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Sexton, John F.—with Rex Ingram Europe
Shaw, Henry—with Douglas Fairbanks Fox Film
Shaw, John—

Smith, Steve Jr.—
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Smyth, Charles—with Universal
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Van Dusen, Ned—
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Warrington, William
Warrington, Harold—
Warrington, Philip H.—with Fox Film
Warrington, Philip H.—with Fox Film

Wick, Arthur C.—Member

Members of the American Society of Cinematographers are held every Monday evening. On the first and the third Monday of each month the next meeting is held, and on the second and the fourth the meeting of the Board of Governors.

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MANAGER

WILLIAM FOX
THE FOX CORPORATION

August 18, 1925.

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yours very truly

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